

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No. : **10/505443**  
Applicant : Muller et al.  
Filing date : September 1, 2004  
Title : Measurement Probe and  
Authentication Device Comprising the Same  
TC/A.U. : 2862  
Examiner : **LeDynh**  
Docket No. : **5484**  
Customer No. : 26936

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Commissioner for Patents  
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**AMENDMENT AFTER FINAL REJECTION**

Sir:

Please amend this application as follows:

**Amendments to the Claims:**

1 - 16. (canceled)

17. (currently amended) Magnetic measurement probe for the acquisition of magnetization data of a magnetic item, said measurement probe comprising at least one magnetizing coil, wherein at least two magnetic sensors are disposed inside said magnetizing coil, one at each end thereof, said sensors having their magnetic axes substantially aligned with the magnetic field inside the coil , and further comprising a probe holder for keeping item in an appropriate position and distance with respect to said magnetizing coil and said sensors, such that the magnetic material M within the detection area of said magnetic sensors is in a magnetic field region of said magnetizing coil where the magnetic field strength does not deviate more than 15 % from its value inside said magnetizing coil.

18. (previously presented) Magnetic measurement probe according to claim 17, wherein said magnetizing coil is a magnetic core free coil.

19. (previously presented) Magnetic measurement probe according to claim 18, wherein said magnetizing coil is a cylinder coil.

20. (previously presented) Magnetic measurement probe according to claim 17, wherein said magnetizing coil is a cylinder coil.

21. (previously presented) Magnetic measurement probe according to claim 17, wherein said magnetic sensors are induction sensors in the form of a sensing coil and a compensating coil, respectively, and the outer diameters of said sensing coil and compensating coil are smaller than the inner diameter of said magnetizing coil.

22. (previously presented) Magnetic measurement probe according to claim 17, wherein said magnetic sensors are magnetic field sensors in the form of a sensing component and a compensating component, respectively, and the outer diameters of said sensing component and compensating component are smaller than the inner diameter of said magnetizing coil.

23. (canceled)

24. (currently amended) Magnetic measurement probe according to claim ~~23~~ 17, wherein said magnetic field strength does not deviate more than 10% from its value inside said magnetizing coil.

25. (currently amended) Magnetic measurement probe according to claim ~~23~~ 17, further comprising a sample support made of non-magnetic material of low electric conductivity.

26. (canceled)

27. (currently amended) Method for measuring magnetization characteristics of at least part of an item, said item comprising at least one magnetic security material, said method comprising the steps of:

a) positioning a measurement probe according to claim 17 on said item, such that said material is within ~~the region H3 of practical field homogeneity of the probe's~~ said magnetic field region of said magnetizing coil where the magnetic field strength does not deviate more than 15 % from its value inside said magnetizing coil,

b) applying by means of said magnetizing coil at least one value of a magnetic field to the item, and

c) measuring at least one value of magnetic characteristic of said material, using said magnetic sensors.

28. (previously presented) Method according to claim 27, wherein said item is a security document or article.

29. (previously presented) Method according to claim 27, wherein the corresponding magnetization value  $B$  of said material is measured upon applying at least one value of magnetic field  $H$  to said material.

30. (previously presented) Method according to claim 27, wherein the corresponding induction value  $dB/dt$  of said material is measured upon application of a magnetic field variation  $dH/dt$  for at least one value of magnetic field  $H$  to said material.

31. (currently amended) Method according to ~~one~~ claim 27, wherein said item is placed on a probe holder.

32. (currently amended) Authentication device for authenticating at least one item, said item comprising at least one magnetic security material, said authentication device comprising:

a) a magnetic measurement probe according to claim 17 for acquiring magnetization data of a magnetic item, said measurement probe comprising at least one magnetizing coil, wherein at least two magnetic sensors are disposed inside said magnetizing coil, one at each end thereof, said sensors having their magnetic axes substantially aligned with the magnetic field inside the coil, and further comprising a probe holder for keeping item in an appropriate position and distance with respect to said magnetizing coil and said sensors, such that the magnetic material  $M$  within the detection area of said magnetic sensors is in a magnetic field region of said magnetizing coil where the magnetic field strength does not deviate more than 15 % from its value inside said magnetizing coil, together with corresponding driving and sampling electronics,

- b) a processing device with implemented algorithm for driving said probe and sampling, digitizing, processing and comparing magnetic characteristic values,
- c) at least one memory device for storing sample and reference magnetic characteristic values.

33. (previously presented) Authentication device according to claim 32, wherein said item is a security marking.

34. (previously presented) Authentication device according to claim 32, further supporting a learning mode for acquiring and storing reference magnetic characteristics of a magnetic reference item, and a testing mode for acquiring, storing and comparing sample magnetic characteristics from a sample item, to derive an authenticity signal.

35. (previously presented) Authentication device according to claim 32, further comprising data transfer means for performing said comparison of the measured magnetization data of the sample with corresponding previously stored reference values and deriving an authenticity yes/no indicator at a remote place and for transmitting back said authenticity indicator an authentication site.

36. (previously presented) Method for authenticating a security document or article, carrying a thin layer of magnetic material, by means of an authentication device according to claim 32, said method comprising the steps of

- a) providing, in a digital memory, magnetic characteristic values of a magnetic reference item, as reference data;
- b) providing a security document or article to be authenticated, said security document or article comprising a thin layer of magnetic material in or on at least part of its surface;

c) acquiring into a digital memory, using said authentication device, magnetic characteristic values of said document or article provided in step (b);

d) processing the digital data acquired in step (c) to correct them for measurement-related circumstances;

e) comparing the data obtained in step (d) with the corresponding stored reference data provided in step (a), using a predefined comparison algorithm and a predefined tolerance criterion, thereby deriving an authenticity yes/no indicator.

37. (previously presented) Method according to claim 36, wherein said reference data are acquired by said authentication device.

**Remarks/Arguments:**

This is a reply to the office action of July 24, in which claims 23 - 25 and 32 - 37 were found to contain allowable matter. A request to withdraw the holding of finality was filed on August 8; we have not yet received a decision.

In any event, we are now amending claim 17 to include the subject matter of claim 23. Dependent claims 18 - 22 depend from 17, so they should be allowable as well. The same to claims 24 and 25, which depended from 23 (now from claim 17). Claim 27, which previously depended from claim 23, has also been amended to depend from claim 17. To avoid any confusion, we have replaced the wording at the end of item (a) of claim 27 by the wording used in claim 17 for the description of the magnetic field region. Support appears in the original specification at page 8, first paragraph, where a definition for the magnetic field region H3 was given. Claims 28 to 31 are dependent from claim 27, and for that reason should also be allowable.

With respect to claim 32 to 37, the examiner has previously indicated that those claims would be allowable if rewritten in the independent form including all the citations of the base claim and any intervening claims. Since claim 17 has been amended to contain the limitations of canceled claim 23, claims 32 to 37 are deemed to be allowable as well.

Respectfully submitted,

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